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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WEI, ZHENG	

ART UNIT	PAPER NUMBER
2192	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/814,758	WU ET AL.	
	Examiner	Art Unit	
	Zheng Wei	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03/31/04; 09/13/04*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2007* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the application filed on 03/31/2004 and amendment filed on 09/13/2004.

2. Claims 1-30 are pending and have been examined.

Oath/Declaration

3. The Office acknowledges receipt of a properly signed oath/declaration filed on 03/31/2004 18, 2004.

Priority

4. The priority date considered for this application is March 31, 2004.

Drawings

5. The drawings filed on March 31, 2004 are objected by the Examiner.

The drawings are objected to because Fig.6, the comments under the shadow are not clear. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate

figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 10, 14-17, 20 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 10, 20 and 30:

It is not clear how an instruction pointer can point into some internal address as applicant claimed in above claims. For the purpose of compact prosecution, the

Examiner treats them as – an instruction pointer pointing into an internal address --.

Claim 14:

Applicant claims "a memory block with a continuous space with size of 2^M", where M is not defined in the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For the purpose of compact prosecution, the Examiner treats it as an integer type variable and the value of 2^M is from 2 to system memory size.

Claims 15-17:

Claims 15-17 are dependent claims of claim 14, therefore, they are also rejected for the same reason above.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Shaylor (Shaylor et al., US 6,446, 084)

Claim 1:

Shaylor discloses a method comprising:

- receiving a code address (current IP- instruction pointer) (see for example, Fig.3, step 302 Retrieve Byte Code From Current IP and related text; also see col.3, lines 9-23)
- querying method metadata for said code address by limiting a search scope within a local memory sub-region of said code address (constant pool) (see for example, Fig.3, step 306 "Invoke Byte Code –Might Require Constant Pool Lookup" and related text; also see col.3, lines 9-23).

Claim 2:

Shaylor also discloses the method of claim 1, further comprising:

- partitioning a global method lookup table into smaller and distributed versions for said local memory sub-region (see for example, Fig.2 item 216 "Method Table", item 220 "Filed Table" and related text).

Claim 3:

Shaylor also discloses the method of claim 2, further comprising:

- maintaining a limited set of methods for which codes are allocated within said local memory sub-region for said smaller and distributed version of the global method lookup table (see for example, Fig.2 item 216 "Method Table" and related text; also see col.4, lines 35-39).

Claim 8:

Shaylor discloses the method of claim 1, further comprising:

- maintaining allocation bits (method pointer) with each bit mapped to a legal object address (actual bytecodes) in heap space (see for example, col.4, lines 35-39); and
- using said allocation bits to identify a code object that encloses an arbitrary code address (see for example, col.6, lines19-21, "Finally, the system returns this method pointer; also see Table 1, code example for detail implementation).

Claim 9:

Shaylor also discloses the method of claim 8, further comprising:

- partitioning the allocation bits into subsets for individual memory blocks (see for example, Fig.2, item 216 "Method Table", item 220 "Field Table" and related text).

Claim 10:

Shaylor also discloses the method of claim 9, further comprising:

- receiving an instruction pointer pointing into some internal address of the code (see for example, Fig.3, step 302 "Retrieve Byte Code From Current IP); and
- locating said code object based on said instruction pointer (see for example, col.5, lines 12-15, "virtual machine 116 first retrieves a byte code from the current instruction pointer (IP)...").

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 4-7, 11-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Shaylor (Shaylor et al., US 6,446, 084).

Claim 4:

Shaylor discloses the method of claim 1, further comprising:

- providing a continuous space to a memory block to locate method metadata (see for example, Fig.2, item 216 "Method Table and related text); and
- placing block information (constant pool) regarding said memory block (see for example, Fig.2, item 206 "Constant Pool" and related text; also see col.6, lines 9-21)

But does not explicitly discloses placing block information at a beginning of the continuous space. However, it is well known in the computer art that put two related memory blocks together can save time for memory access from one memory block to another by reducing the pointer jump distance. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to put block information at the beginning of the memory block to save memory access time and further improving the lookup efficiency.

Claim 5:

Shaylor discloses the method of claim 4 above, Shaylor further discloses the method comprising:

- providing a pointer (class pointer) to a distributed method lookup table from said block information (see for example, col.6, lines 8-21, "The system uses

the class pointer, the method name and the type information to lookup a method pointer in method table).

Claim 6:

Shaylor further discloses the method of claim 5, wherein table entries of said distributed method lookup table represent code objects created in said memory block (see for example, fig.2, item 218 "Bytecode" and related text: also see col.4, lines 35-29, "This includes bytecode 218, which includes a string of bytes to be executed by virtual machine...").

Claim 7:

Shaylor also discloses the method of claim 5, further comprising:

- providing a virtual machine (see for example, col.4, lines 35-29, "This includes bytecode 218, which includes a string of bytes to be executed by virtual machine..."); and
- providing a garbage collector for said virtual machine to maintain said distributed method lookup table (see for example, col.5, lines 4-8, "In particular, the garbage collector must be informed of the possible pointers in the constant pool").

Claims 11-20:

Claims 11-20 are system version for performing the claimed method as in claims 1-10 addressed above, wherein all claimed limitation functions have been addressed and/or set forth above and certainly a computer system would need to run and/or practice such function steps disclosed by reference above. Thus, they also would have been obvious.

Claims 21-30

Claims 21-30 are computer program products/article version of the claimed method, wherein all claimed limitation functions have been addressed in claims 1-10 above respectively. It is well known in the computer art that such method steps can be implemented as computer program and can be practiced and /or stored on a computer operable media. Thus, they also would have been obvious in view of reference teachings above.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Sokolov et al., (US 2002/0174261) discloses lightweight native method invocation interface for java computing environments.

- Wangtun Chou (2002/0095664) discloses a method for building pointer lookup table for mapping a running code of each bytecode to a respective subroutine.
- Dutchyn et al. (Multi-Dispatch in the Java Virtual Machine: Design and Implementation) discloses a method to extend the Java Virtual Machine to support multi-dispatch.
- Power et al., (Symbol Table Construction and Name Lookup in ISO C++) discloses an object-oriented model of symbol table construction and name lookup for ISO C++ using UML.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zheng Wei whose telephone number is (571) 270-1059 and Fax number is (571) 270-2059. The examiner can normally be reached on Monday-Thursday 8:00-15:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571- 272-1000.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ZW

TUAN DAM
SUPERVISORY PATENT EXAMINER